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MAY 24, 1952

SCIENCE NEWS LETTER

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TECHNOLOGY

Beer-Proof Piano

Sloping lids, fire-proofed plastic keys and anchored string assembly among features of unusual piano on display in London along with 10,000 other items.

➤ A BEER-PROOF piano of revolutionary design is science's latest answer to destructive servicemen who want more out of a piano than music.

It was on display at the British Industries Fair in London along with 10,000 other new or improved items. The piano is built of solid oak and has no sharp edges to bruise servicemen should they fall against it during horseplay.

It has sloping lids and ledges that beer mugs and cigarettes will not stay on; fire-proofed keys covered with a plastic that cannot be picked off, and an extra-loud volume to discourage heavy ammunition-boots on the loud pedal.

Built by Lambert London, Ltd., a firm that has reconditioned hundreds of pianos from service canteens, the new instrument incorporates some safety features deemed wise from past experience.

For instance, its designers fixed it so that curious servicemen could see the insides work without having to rip off a single chunk of wood. But designers anchored the bottom boards so they could not be taken off and used as backing for dart targets. They also fixed it so servicemen could not stuff food or throw money into the works.

Special attention was given to anchoring the string assembly inside the piano after an RAF unit took a conventional piano apart to use the string assembly as a harp in a nativity play.

Commenting on the gaff pianos must take in service canteens, a British service organization said, "Apparently standard pianos could not stand up indefinitely to having their insides sluiced with beer, their lids ringed from glasses, their keys burned by cigarettes, and high-spirited canteen cowboys breaking apart the caseworks."

Three unusual pianos, one of them being "liberally poisoned," were also displayed at the fair. The poisoned piano is designed for use in the tropics. It has deadly chemicals impregnated in the works to protect felts and hammers from destructive insects.

The world's largest grand piano and a tiny piano especially suited to crowded efficiency apartments were also shown in the "musical" section of the fair. The large grand piano weighs a ton, is 11 feet 8 inches long and has resounding bass tones.

The small piano is designed to fit inconspicuously into any odd corner, yet it has good quality of tone. Billed as the world's smallest piano, the instrument attracted such crowds when first displayed that policemen had to be called in to keep order in the showrooms.

A new device for amplifying voices from a telephone receiver also was shown at the fair. The receiver can be laid on a battery-operated amplifier that occupies less than six inches of desk space. The amplifier reproduces voices loud enough for a roomful of persons to hear the conversation at once.

An "unburstable sack" for grain packaging has been found extra-durable when compared with other jute sacks. The secret of the sack is its woven seams instead of conventional sewn seams.

A collapsible all-steel ironing table weighing only 15 pounds has tubular legs that are extended or folded in a single movement. There is no danger of nipped fingers. An automatic locking device keeps the board rigid while in use. The surface is perforated with 1,000 holes that allow heat and steam to escape.

A new kind of coin-operated radio displayed at the fair can be installed in hotels and used by guests without fear of disturbing persons in adjoining rooms who want to sleep. The volume of all sets can be controlled from a master panel by the hotel manager.

A multi-purpose bed chair made of light tubular steel has a back and two long arms ending in rubber handles. A foot rest with two elastic foot supports can be attached easily or detached by the patient. The chair is said to be useful in orthopedics and in physiotherapy.

A garment designed for television viewers was displayed in the clothing section of the fair. Known as the telejacket, the garment is cut from fine velvet cord, has a shawl collar and gives complete freedom of movement.

Science News Letter, May 24, 1952

NATURAL RESOURCES

World's Dry Areas Can Learn From Each Other

➤ DROUGHT AND desert areas in one part of the world have their counterparts in other parts of the world. Methods which work to alleviate dry conditions in one place will probably work in similar places.

These are the conclusions of Dr. Peveril Meigs, Vienna, Va., representing the International Geographical Union at an international meeting on desert problems in Jerusalem.

Dr. Meigs presented a large-scale map showing the distribution throughout the world of the climatic types of Israel. He brought out that an area in the vicinity of Riverside, Calif., and one on the coast of Lower California are much like the Negev desert of southern Israel, Morocco and much of southern Australia. The greater part of the Colorado desert of California and Arizona, he said, resembles the desert type of the Jordan River valley.

These and other similar areas of the world were pointed out on what Dr. Meigs called homoclimatic maps. He said they may suggest areas from which plant and animal introductions, methods of land and water use, or ideas on clothing and housing can be successfully transmitted to areas of similar climate.

Science News Letter, May 24, 1952

MARINE BIOLOGY

Whale of an Itch Brings Crab Trap Ruin

➤ GRAY WHALES are scratching themselves on crab traps and are ruining them, fishermen in Astonia, Ore., are complaining. Schools of gray whales are traveling north in their annual spring migration. They are sighted spouting and contorting a short distance from shore all along the Oregon coast.

Crab anglers wish the whales would find another means of satisfying their itches and thus leave their crab pots alone.

Science News Letter, May 24, 1952

BACTERIOLOGY

Filter Tags Germs In Fifteen Hours

➤ A NEW filter device developed by the U. S. Army Chemical Corps will detect and identify germs in the air in 15 hours instead of almost four days.

This progress in defense against germ warfare was announced by Brigadier General William M. Creasy, commanding general, Chemical Corps Research and Engineering Command, at the meeting of the Armed Forces Chemical Association in Chicago.

Now under development, he reported, is a radiation dosage indicator which will tell a fighter exposed to radiological warfare how much more radiation he can safely take.

The Chemical Corps is now emphasizing development of equipment to make any reasonably air-tight building or shelter safe against poison gas, germs or radiological agents spread through air. This type of "collective protection" is needed because protective clothing and masks against all three possible agents are too bulky and uncomfortable to be worn for long periods.

Needed, Gen. Creasy said, is a "chemical nose" which will smell out and identify as many different types of poison gases as possible and, by connection to a mechanical brain with "electrical vocal cords," announce its findings.

Science News Letter, May 24, 1952

BIOLOGICAL PSYCHIATRY

Chemical Aids Mental Ill

Schizophrenics rescued from catatonic trance by injection of cholinesterase and other compounds into their brains. Amount of improvement varies.

➤ A FEW patients have now been rescued, temporarily, from the death-like catatonic trance of the mental disease, schizophrenia, by injections of a chemical into their brains, a group of doctors and research scientists from London, England, and Chicago and Manteno, Ill., reported at the meeting of the Society of Biological Psychiatry in Atlantic City, N. J.

From a rigid, mute and helpless state, patients begin to move, talk and lose their gray pallor. One even could work, go to parties and dance.

The scientists reporting the work on patients and research on cats in catatonic trances from brain injury are: Dr. Stephen L. Sherwood of the Middlesex Hospital, London; Drs. Warren S. McCulloch and P. M. Cooke and Miss Ellen Ridley of the University of Illinois College of Medicine, Chicago; and Drs. W. H. Mosberg, T. N. Tausig and A. P. Bay of the Illinois State Hospital for Mental Diseases, Manteno, Ill.

In some of the patients given this new chemical treatment, improvement lasted only half or three-quarters of an hour. In others the improvement has lasted for eight or nine months. All were patients who for years had been lying helpless in their trance-like state, needing to be fed and cared for in every way like a baby, and who had not been helped by any other form of treatment.

Some patients relapsed soon after treatment and then began to improve again spontaneously without further treatment.

The trial of this new treatment is still too new for doctors to make any guess as to the future. At Manteno it is considered at least promising enough so that plans have been made to so treat more patients.

Some patients who relapse partially or completely can be restored to a more nearly normal state by a second treatment. Whether the injections into the brain can be repeated indefinitely, and how long the periods of improvement will be, are questions that cannot be answered yet.

The chemical used at Manteno is cholinesterase. This is a body chemical which normally destroys the acetylcholine set free when nerve endings in voluntary muscles are stimulated to contract the muscles. The cholinesterase prevents too much acetylcholine from accumulating at nerve endings.

A number of chemicals counteract cholinesterase. Among these is di-isofluorophosphonate. In large doses this chemical produces symptoms resembling some mental diseases and aggravates the signs and symptoms of schizophrenia. These findings, by other scientists, gave Dr. Sherwood the idea that cholinesterase and similar drugs counteracting acetylcholine might reduce symptoms of schizophrenia. First report of his early work and of the Chicago group's study of cats was made in February of this year (See SNL, Feb. 16, p. 99.)

In his work with patients at Severalls Hospital, Colchester, England, Dr. Sherwood tried flaxedil and pentamethonium iodide as well as cholinesterase. The effect was most marked with cholinesterase in the first patient and with the iodide chemical in three cases, he reported in the English journal, BRAIN.

The doctors at Manteno have been using cholinesterase specially prepared for them.

Science News Letter, May 24, 1952

PUBLIC HEALTH

Legally Standard Bread Required by Aug. 13

➤ STARTING NEXT Aug. 13, our bread, unless we bake it at home, will be standardized legally for the first time in our nation's history. After that date all white bread, enriched bread, milk bread, raisin bread and whole wheat bread which is shipped across state lines for sale must be produced in conformity with the standards issued under the Federal Food, Drug and Cosmetic Act.

If you buy a loaf of whole wheat bread after that date, it must be made from 100% whole wheat flour. Otherwise it cannot be sold as whole wheat bread and must have on its label a list of its ingredients.

Raisin bread, after that date, must contain not less than 50 parts by weight of raisins to each 100 parts of flour.

Milk bread must be made with whole milk as the sole moistening ingredient or with an equivalent amount of other milk products. For each 100 parts of flour there must be at least 8.2% by weight of milk solids.

Rye, pumpernickel, cracked wheat and other varieties of bread for which standards have not been set must have a complete list of ingredients on the label.

Polyoxyethylene compounds, so-called softeners, are not permitted under the standards because their use could deceive consumers as to the age of the bread and their safety as bread ingredients has not been adequately tested, in the opinion of Federal Security Administrator Oscar Ewing.

Mono- and diglycerides, from natural fats and oils, are permitted in shortening on the grounds of safety and non-deception.

Provisions on both these classes of chemicals may be changed if further evidence shows they should be.

Science News Letter, May 24, 1952

"LOVE" ON A LION—This ancient figure imitates lost Hellenistic Greek models. It was found by Dr. W. F. Albright while digging near Qataban in Arabia. The inscription on the bottom is in South Arabic. (See SNL, May 10, p. 296).

ASTRONOMY

Sun Energy Changes

Variations in amount of radiation received from sun may cause long-term climate changes. Corpuscular stream proposed to account for warm polar climates.

➤ THE ICE Ages were probably caused by changes in the tremendous outpouring of energy from the sun, Dr. Barbara Bell of the Harvard College Observatory suggested at a Symposium on Climatic Change in Boston.

Variations in the solar constant, a measure of the sun's radiation received on the earth, seem to be required, she said, to explain how climatic conditions have varied over a long period of time, with the great ice sheets advancing during glacial, or very cold, periods, then later retreating.

To account for a once-warm climate at the poles, Dr. Bell suggested a steady stream of particle radiation from the sun, such as is believed to cause the bright shimmerings of the auroras. This is the only source of energy now known that acts only in high latitudes, according to the theory of the aurora outlined to the Symposium by Dr. Donald Menzel, astrophysics professor at Harvard University. Dr. Menzel reported that he believes solar particles are the cause of the aurora.

The amount and constancy of such solar particle radiation, Dr. Bell suggested, may help determine the rate of change of the lower atmospheric blanket with latitude and thus affect the earth's atmospheric ciculation pattern. The energy of this corpuscular radiation is about equal to that received during the day in ordinary solar radiation.

During the two-day Symposium, scientists of many different specialties, from astronomy to geology to weather forecasting, pooled their knowledge in an attempt to decide what is needed, either here or on other planets, for the beginning and continuance of life. Dr. Harlow Shapley was chairman of the Symposium sponsored by the American Academy of Arts and Sciences.

Dr. Menzel suggested that a giant invisible funnel formed in the earth's magnetic lines of force could act as a passageway through which solar particles would flow. Ordinarily these magnetic lines of force are thought to act like a bumper, routing most of the particles so that they flow around the earth. But when a particularly dense clump in the ionized gas clouds strike the invisible magetic lines, they are bent. And when more dense clumps pile into a depression thus formed, a giant funnel is formed. When the solar particles pour through the funnel into our atmosphere, there are the most intense occurrences of aurora, Dr. Menzel believes.

Science News Letter, May 24, 1952

PSYCHIATRY

Brain Wave Patterns Spot Good Citizens in Convicts

➤ CONVICTS WHO might be remade into good citizens by careful medical and psychiatric treatment can be distinguished by their wave patterns from those who will always have to be kept in prison.

Contrary to what might be expected, those who can be helped are the ones with relatively unstable personalities which are accompanied by abnormal brain wave patterns. The psychopathic deviates who are repeatedly in collisions with the law and cannot assume responsibility in the community have fixed personality patterns and are much more likely to have normal brain wave patterns.

Studies showing this, made at Washington State Penitentiary, were reported to the American Psychiatric Association meeting in Atlantic City, by Dr. Sol Levy of the Eastern State Hospital, Medical Lake, Washington, and Dr. Margaret A. Kennard of the University of British Columbia Medical School, Vancouver, B. C.

Science News Letter, May 24, 1952

Question Box

ARCHAEOLOGY

What is the age of oldest maize pollen grains ever found? p. 335.

DENTISTRY

What percentage of absenteeism is caused by toothaches? p. 325.

ENTOMOLOGY

What U. S. insecticide is being used to fight the locust plague in the Middle East? p. 326.

MEDICINE

How could now-wasted blood be used? p. 329.

METEOROLOGY

How can the world's weather be demonstrated in a dishpan? p. 328.

NATURAL RESOURCES

How many acres of the world's arid soil could be irrigated? p. 328.

PSYCHIATRY

What is "distance" psychoanalysis? p. 326.

Why trace the history of old-time alcoholics? p. 326.

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ELECTRONICS

Tell If Speaker Is Boring

Electromagnetic movement meter measures amount of fidgeting done by audience. Quoting statistics found to cause much fidgeting among listeners.

➤ ARE YOU a bore?

If your best friends won't tell you, the invention of a University of Oklahoma professor will.

The tattle-tale device is an electromagnetic movement meter developed by Dr. Elwood A. Kretsinger, assistant professor of speech. The audience-reaction machine measures the amount of fidgeting or physical movement in a group of listeners.

It consists of three instruments. One feeds electromagnetic energy into a wire strung along the backs of chairs where the audience is seated. As the listeners move, the energy they absorb is recorded on an amplifier, and another instrument charts the movements on a long coil of graph paper.

Study the red-ink squiggles on the paper tape, compare them with a carefully timed speech and you have a picture record of where you lost your audience's interest.

If you have quoted a boring batch of statistics for five minutes, the tape will tell the tale. Instead of a steady, relatively even red line, the meter will zig-zag back and forth like a drunk trying to walk a chalk line.

Dr. Kretsinger has a four-year background in radio and radar while in the Marines during World War II, plus experience as a seismograph engineer doing geophysical exploration for a short time following his discharge.

At the University of Southern California in 1949, where he was working on his Ph.D., Dr. Kretsinger developed his meter, after helping set up equipment for a series of studies on dramatic plays.

"We began to wonder if there wasn't a way we could measure audience reaction, to get unconscious response, and hit on the idea of doing it electronically," he said.

The movement meter is most effective in recording reaction to serious works.

"In some passages, the only response you want is lack of movement," Dr. Kretsinger explained. "Repeated tests showed us that where there is maximum movement in the audience, there is minimum interest in the drama."

To glue his test audiences to their seats, Dr. Kretsinger used dynamic recordings of recent historic events. To induce fidgets, he played a recording of a speech in which a woman explained how she raised squash.

So far the meter has been used only to test the reactions of adult audiences.

"A group of children probably would give us completely different results," he pointed out. "Youngsters move for everything, often wiggling when they are particularly interested. I want to try the meter on them one of these days."

The audience never touches the wiring for the meter, and the wire can be hidden on a panel placed behind a bank of chairs. The present equipment will test the reactions of 12 persons at a time, but he would like to have enough meters to test individual reactions in a larger group.

Two of the electrical units plus the ink-writing recorder cost about $550.

Science News Letter, May 24, 1952

PSYCHIATRY

Normal People Focus Energies on Main Problem

➤ "NORMAL PEOPLE are those who grow up to focus their energies on main problems."

This definition was offered by Dr. Earl D. Bond of Philadelphia at the meeting of the American Psychiatric Association in Atlantic City.

Normal people, however, are not uninteresting and they are not perfect, Dr. Bond declared.

Psychiatric and psychologic examinations of 64 college students, men and women who were members of student councils and as normal as could be found, showed that half were "carrying an important neurotic disability" and that nine were in serious neurotic trouble at the time. The moral of the study, given by Dr. Bond:

"To demonstrate that so many gifted and successful people have neurotic handicaps may be a source of comfort to others like them who now see normality as an all or nothing proposition."

Science News Letter, May 24, 1952

DUMMY "MAN"—With a skeleton of steel, loaded with lead and covered by rubberized foam, this dummy will take free falls through space just as an unconscious man would. The model, developed by W. S. Ruff, will be dumped from high-speed planes at high altitudes.

DENTISTRY

Toothache Causes 2% To Play Hooky From Jobs

➤ TOOTHACHE CAUSES about two percent of all industrial absenteeism, Dr. James M. Dunning of Harvard School of Dental Medicine calculates.

This figure is exclusive of absences from more remote effects of dental disease.

Relief emergency service in one industrial plant, requiring about 10 minutes in the dental chair for each case, returned to work over 85% of the employees seen at the dental clinic, Dr. Dunning reported to the Industrial Health Conference, Boston.

Additional reductions in absenteeism and substantial saving of teeth for the average worker can be achieved by a service which also provides dental health education, dental examination and referral to private dentists of cases needing corrective or restorative treatment.

The nation's teeth need 700 million fillings, according to figures compiled by the American Dental Association.

It would take five times as many dentists as we now have to catch up within a single year with this backlog of needed fillings. These figures do not include needed extractions, bridges, crowns, dentures, examinations, X-rays, cleaning, fluoride applications and other dental services.

Science News Letter, May 24, 1952

ELECTRONICS

Electronic Megaphone Uses Transistor Amplifiers

➤ THE MEGAPHONE has gone electronic. Through use of the new transistor amplifiers powered by tiny drycells, a normal speaking voice is turned into a sturdy shout for any outdoors communication, from cheerleading to military command.

It was demonstrated by Richard F. Shea of General Electric's Electronics Laboratory, Syracuse, N. Y., to electromics engineers meeting in Washington.

Science News Letter, May 24, 1952

ENTOMOLOGY

Fight Locust Plague

Aldrin being used to beat back insect hordes, now attacking more viciously than anytime in the last century. Many nations join in the battle.

➤ ALDRIN, AN American insecticide, is leading an international attack against the worst locust plaque in the last 100 years. The insect-killing chemical is so powerful that one and a third ounces mixed with a gallon of water will cover an acre with certain death.

Supplies of the deadly chemical on hand in the infestd area include: 28 tons in Karachi, India, 20 tons in Aden, Arabia, 20 tons in Beirut, Lebanon, and nine tons in Teheran, Iran. Aldrin is a chlorinated hydrocarbon distantly related to DDT and chlordane.

Locusts, the most ancient of man's insect enemies and one of the worst, are being fought in a powerful air-ground attack backed by many nations through the United Nations' Food and Agricultural Organization and Point 4. Since the insect hordes do not respect man's artificial boundaries, even Russia has joined the battle.

William B. Mabee, technical director of the locust control problem, reports from Baghdad, Iraq, that "so far, despite wind, sand, rain and floods, the air unit in Iraq has sprayed 5,000 acres of locusts. This, it is felt, not only prevented damage and reproduction from these (locust) bands, but has cleared a gross area twice that size. These demonstrations have been conducted in seven different areas, Hash Hash, Al Busayah, Jaw Leben, Rafee, Tkayyid, Safwan and Av Raudha."

Mr. Mabee has been joined in Iraq by Robert B. Thrailkill, who is also a veteran of the U. S. Department of Agriculture's grasshopper control program of this country.

Less than half a million dollars of the U. S. money is being spent in the air-borne battle against the locust invasion that threatens, according to official Washington estimates, about 2,000,000 acres in Iran and nearly 200,000 acres in Jordan and Iraq. Ground equipment is also used to help halt the invaders.

Locusts breed in waste places and creep about wingless in great mobs while they are young. It is then that they are most easily attacked by anti-locust forces. The insect threatening food supplies of millions of farmers in Asia and Africa is the desert locust, known as *Schistocera gregaria*. Agricultural life and economy of an area only slightly less than that of the United States is endangered by the insect hordes.

Locusts of different kinds are present on every continent. They inhabit dry grasslands and deserts from Africa to India, and swarms of the insects arrive during the summer monsoon in India. In autumn the locusts migrate to Iran and Arabia and then across the Red Sea to African countries.

The broad effort to bring the desert locust under control stems from last year's successful handling of the insects for the first time by aerial spray in Iran. Most of the locust-plagued countries have, through the years, developed well-organized ground control operations for spreading poisons. Ground measures, however, do not give the mobility and means for reaching remote areas that light, spraying planes do.

Average annual crop losses to the desert locust have been estimated at $80,000,000. Locust breeding and locust damage are almost continuous, occurring at every season in one place or another.

Science News Letter, May 24, 1952

PSYCHIATRY

"Distance" Psychoanalysis

➤ SUCCESS with a new method of treating mental sickness, called "distance" psychoanalysis, was reported by Dr. Rudolf Ekstein and Mrs. Dorothy Wright of the Southard School, Topeka, Kans., at the meeting of the American Psychiatric Association in Atlantic City.

By this method, Tommy "the space child" was brought back planet by planet and finally mile by mile to his own town and nine-year-old problems and so rescued from becoming a permanent dweller in the dream world of the mental sickness, schizophrenia.

On the surface, Tommy was "a meek, frightened, asthmatic little fellow" with no ability for making friends or getting close emotionally to other people. In his imagination he was a five-star general with headquarters on a remote planet, "a true master of the universe, using space ships to conquer and destroy remote planets, even the whole solar system."

Other little boys play at such games, but the play remains a game and usually there is a companion who is at least a four-star general playing the game, too. In Tommy's case, it was no game. Frustrating earlier years in an unhappy family situation gave him such hostile feelings that he was afraid of them. So he had to remove them, safely he thought, hundreds and thousands of light years away. But in so doing he was losing contact with reality and was on his way to insanity.

To bring him back to the real world, Mrs. Wright did not attack the fantasies but did attack the distance that separated them from the boy. When she finally got Tommy to the point where he could bring his "monster self" back altogether, he became a very destructive monster. She refrained from moralizing or condemning at this stage, and she gave him strength to cope with the frightening part of his personality.

Tommy's recovery, however, is credited to her concern with the manner of space defense which he used rather than to the treatment after he was brought back to earth and to himself.

Science News Letter, May 24, 1952

AERONAUTICS

Airplane Exhaust Gases Heat Cabins Safely

➤ AIRPLANE GASES which once viciously attacked the aluminum and magnesium alloys of aircraft bodies now can be used safely to heat cold cabins and to melt ice from wings.

Corrosion contaminants in airplane engine exhaust gases have been successfully removed by a "de-corroder" demonstrated to the U. S. Air Force by the Ryan Aeronautical Company, San Diego, Calif.

Without such a device, in relatively few hours the exhaust contaminants would penetrate the pipes of the heating system to an alarming degree.

Science News Letter, May 24, 1952

PSYCHIATRY

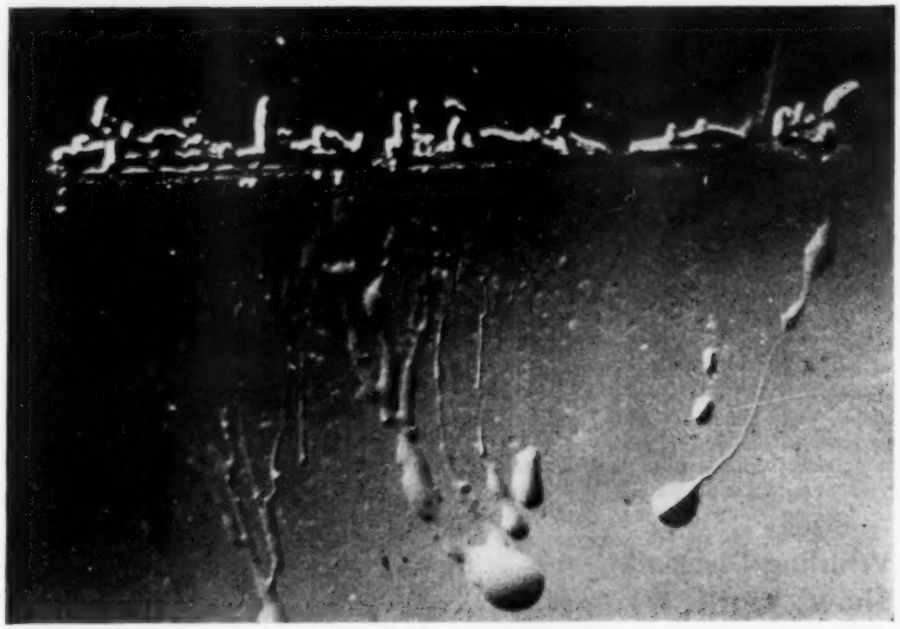
Trace History of Old-Time Alcoholics

➤ WHAT HAPPENED to the alcoholic of grandpa's day? The question is timely because medical treatment for alcoholics two generations ago was limited so the history of those old-time drunks shows what can happen to atomic age imbibers who do not get or take medical treatment.

Reporting to the American Psychiatric Association meeting in Atlantic City, Dr. Frederick Lemere of the University of Washington School of Medicine, Seattle, said that of 500 such untreated alcoholics: the average length of life was 56; 28% drank themselves to death; 10% moderated their drinking until it was no longer a serious problem; 29% continued drinking at about the same rate; 11% committed suicide; six percent died insane; 19% were divorced and five percent became derelicts.

Twenty-two percent quit drinking because of a final illness and 11% quit exclusive of such cause. Of these, 68% did so without outside help, 24% following religious conversion and eight percent following medical treatment.

Science News Letter, May 24, 1952



GASOLINE ENGINE EXHAUST—A jet impactor in Los Angeles collected this sample of what is being thrown into the air every day in the United States from the exhausts of millions of cars.

CHEMISTRY

Study Smog Causes

➤ DIRTY AIR or smog is not due to any one kind of pollution of the atmosphere we breathe. Many kinds of wastes of automotive transportation, industry and heating are poured out into the air. These substances, by the ton, react with each other to form compounds that science has not yet identified.

This was made known at the Second National Air Pollution Symposium in Los Angeles.

Stanford Research Institute scientists found in their studies that smog has uncommonly strong oxidizing powers. Rubber in smog areas cracks in a relatively short time. The air contaminants are gases, solids and liquids. One of the large volume sources of contaminated air consists of more than 125,000 tons of exhaust from automobiles, trucks and buses in the Los Angeles area alone.

Samples of polluted air can be collected for analysis by a jet impactor. This device collects the very fine, or aerosol, particles by impinging a high velocity air stream on a surface in such a way that the air stream is required to turn in a very small radius of curvature. In this way, small particles in the air stream do not have their momentum changed enough in a short distance to avoid striking the deflecting surface.

Dr. Sylvan Rubin of Stanford Research Institute reported his results using the jet impactor, part of a research program on the nature of smog, in the JOURNAL OF ATMOSPHERIC AND TERRESTRIAL PHYSICS.

The amount of liquid picked up on the impactor's glass slide varied greatly but was always related to the haziness of the atmosphere, Dr. Rubin found.

Science News Letter, May 24, 1952

METEOROLOGY

Abundant Showers for Most of Nation to June 15

➤ "ABUNDANT SHOWERS" are in prospect until the middle of June over most of the nation, particularly in the northeast quarter.

But west of the Continental Divide and along the Gulf Coast people can expect less than the usual amounts of rainfall up to mid-June. This was the long-range weather forecast of the Weather Bureau's Extended Forecast Section.

Where less than normal rainfall is expected, the weather will be hotter than usual until mid-June. The temperature will also be higher in the rest of the south in addition to the Gulf Coast States. The northern and central plains and areas eastward through the North Atlantic states will be cooler than usual, while the rest of the nation can expect about normal temperatures.

Science News Letter, May 24, 1952

ENGINEERING

Tests Show Road Damage by Trucks

See Front Cover

➤ EVIDENCE THAT heavily loaded trucks break up highways has been found in tests conducted near La Plata, Md., for the highway departments of 11 states and the District of Columbia.

Designed to reveal the effects of four different kinds of axle loads on concrete pavement, the road research project was started in 1949 by the Interregional Council on Highway Transporation.

The group ran seven trucks over 1.1 miles of the Maryland highway a total of 238,000 times. The first published findings showed:

Trucks loaded to 22,400 pounds caused 6.4 times more cracking than those hauling 18,000 pounds. On the trucks with two sets of rear wheels and axles, 44,800-pound loads caused 12.3 times as much cracking as 32,000-pound loads. The figures were based on "all types" of subgrade under the test road.

The project was under the direction of the Highway Research Board of the National Research Council. Truck manufacturers and oil companies cooperated in the road tests.

Shown on the cover of this week's SCIENCE NEWS LETTER is the effect of one of the speeding trucks on the test pavement.

Science News Letter, May 24, 1952

PHYSICS

"Swimming Pool" Shields Low-Power Nuclear Reactor

➤ "A "SWIMMING POOL" is being used in Oak Ridge, Tenn., to cut down deadly radiations from a low-power nuclear reactor set up to aid development of better reactor shields.

Results of research with the reactor are expected to speed development of atomic-powered planes.

The reactor, an assembly of movable nuclear fuel elements placed on end in an aluminum grid, can be moved about within the pool. It is suspended by an aluminum framework from what is called the reactor bridge, which rests on wheels fitted to rails along either side of the pool.

An instrument bridge also spans the pool and operates on the rails. Using a carriage that slides up and down on the framework attached to this bridge, operators can place test instruments at any point in the pool.

The reactor uses fuel elements designed for the materials testing reactor, a large unit recently put into operation in Idaho. Its development was announced jointly by Union Carbide and Carbon Corporation and the Oak Ridge Operations Office of the U. S. Atomic Energy Commission, Oak Ridge, Tenn.

Science News Letter, May 24, 1952

NATURAL RESOURCES

Could Irrigate 200 Million Acres of World's Arid Soil

➤ SOME 200 million additional acres of the world's arid soils could be irrigated economically and made to produce food for the increasing population of the globe, Dr. Charles E. Kellogg, chief of the U. S. Department of Agriculture's soil survey division, told the International Symposium on Desert Research in Jerusalem.

Soils to be irrigated would need to be selected and managed with the bests skills available, he emphasized, in order to prevent failures and loss of investments in the irrigation works.

About 275 million acres of soil in the world are now irrigated, and a little less than half of this, about 103 million acres, is arid soil. Nearly 30% of the earth's land area, or a bit under 8¾ billion acres is classed as desert or arid soils.

Soil scientists have not had adequate opportunities to study arid soils remote from the present population centers, Dr. Kellogg said. Even when water is scarce, knowledge of the formation and development of arid soils will aid in their use for grazing without irrigation.

Permeability of soil in relation to drainage and salt removal needs to be understood in order to work out methods of modifying structure and water-holding capacity through green-maturing crops, organic soil conditioners and in other ways.

Teams of experts will be needed, in Dr. Kellogg's opinion, to transform successfully wild land into new farms. The task is very different from gradual improvement of farms that are already "going concerns" in humid regions.

Science News Letter, May 24, 1952

STATISTICS

Columbia River Floods Predicted by New Method

➤ FLOODS OF the Columbia river can be predicted at least a year in advance, Louis H. Bean of the U. S. Department of Agriculture told the American Geophysical Union meeting in Washington.

For 1952, the amount of water discharged by this great river will be about 700,000 cubic feet per second, Mr. Bean forecast. This is below the usual flood level for the Columbia.

He made this and three other water volume predictions three years ago, on the basis of records available through 1948. His forecasts for the years 1949, 1950 and 1951 were quite close to the actual record taken of the Columbia river's outpouring near The Dalles, Ore.

Mr. Bean's prediction of the discharge for 1952, 700,000 cubic feet per second, is quite close to that estimated by another method described to the meeting by M. W. Nelson of the Soil Conservation Service, Boise, Idaho, H. G. Wilm of the U. S. Forest Service, and R. A. Work of the Soil Conservation Service in Medford, Ore.

On the basis of up-to-date figures for recent rainfalls plus those for the rainfalls of last fall and for the winter's snows, they estimate that the river's discharge volume will reach 675,000 cubic feet per second.

The three scientists use only records taken since the previous fall in making their estimate. Mr. Bean bases his predictions on an analytical study of the records of the river for as many years as possible. The same technique, he said, could be applied not only to the Missouri river, foretelling the floods there this year, but can also be applied to crops, weather famines and a wide variety of other natural phenomena.

Science News Letter, May 24, 1952

METEOROLOGY

Whirling Dishpan Shows World Weather

➤ THE WEATHER of half the world can now be created in a rotating dishpan and studied indoors.

Dr. Dave Fultz, 30-year-old assistant professor of meteorology at the University of Chicago, described his laboratory weather at a meeting of the American Meteorological Society in Washington. He won the society's Meisinger Award for his work with the rotating dishpans.

Water, with tracer chemicals such as dyes or aluminum powder, is put into the dishpan to create a reasonable facsimile of the general circulation patterns over the northern hemisphere of the world. The dishpan is then heated in specific places and set rotating.

The rotation is similar to the revolving of the earth. To observe the movements of water in relation to this going around, Dr. Fultz "stops" his simulated hemisphere with an optical instrument which goes around in the opposite diretcion.

He can then see how the heat he has applied, like the heat of the sun on the real thing, sets up fast and slow "wind" currents which undulate over the face of the earth. He has even put "mountains" made of small blocks of wood in the bottom of his dishpans and observed the formation of anticyclones and resulting turbulence in the "wind" currents.

Formerly, meteorologists had to set up their theories of how the weather works from the obviously inadequate observations they could make of all weather conditions over an entire half of the real globe. Now, according to Dr. Fultz, the general circulation patterns which bring us today's and tomorrow's weather can be observed in a 15-inch dishpan. He says that some striking disagreements with classical theories about the weather already are evident.

Science News Letter, May 24, 1952

IN SCIENCE

PSYCHIATRY

Adrenal Removal Improves Condition of Mental Patients

➤ AN OPERATION which has been used to help far advanced cancer patients is now being tried as a means of restoring mental patients to sanity.

The operation consists in removal of the adrenal glands. It improved both physical and mental health of two patients with both cancer and mental disease, and brought temporary improvement in the mental condition of two more mental patients who did not have cancer.

The operation, tried because of a relation between adrenal glands, brain metabolism and mental functioning, was reported to the American Psychiatric Association meeting in Atlantic City by Drs. Nathaniel S. Apter, W. C. Halstead, D. M. Bergenstal and C. M. Huggins of the University of Chicago, Drs. H. Hoagland and Gregory Pincus of Worcester Foundation of Massachusetts, and Dr. A. P. Bay of Manteno, Ill., State Hospital.

Science News Letter, May 24, 1952

TECHNOLOGY

Ultrasonics Not Practical To Kill Sewage Bacteria

➤ ULTRASONICS DO not seem to offer the sanitation engineer an economical way to kill bacteria in sewage at present, three members of the civil and sanitary engineering department of the Massachusetts Institute of Technology, Cambridge, Mass., have concluded.

In a joint report by John P. Horton, Murray P. Horwood and Donald E. Phinney to the Federation of Sewage and Industrial Wastes Associations, the men said that although ultrasonics can be used to kill bacteria, they have at least three limitations:

1. They are absorbed quickly by waste liquids unless the liquids are exposed to them in shallow depths.

2. The presence of solid particles in waste liquids reduces the lethal effect of ultrasonic vibrations.

3. The bacteria-killing rate of ultrasonics drops off rapidly with a decrease in surface tension caused by the presence of organic compounds in the sewage.

Based on current cost estimates and figuring electric power at two cents per kilowatt-hour, the men concluded that it would cost about $15,000 to sterilize 1,000,000 gallons of water, even if the liquid already was near 140 degrees Fahrenheit, a temperature that yields a high bacteria-killing rate.

Science News Letter, May 24, 1952

SCIENCE FIELDS

MEDICINE

Blood Cells Wasted Could Yield Protein To Save Lives

➤ ENOUGH PROTEIN to keep 100,000 persons nourished for 10 days could be salvaged from the red blood cells thrown out each year in the production of blood plasma, Dr. Charles S. Davidson of Harvard Medical School and the National Institute of Arthritis and Metabolic Diseases declared at a symposium on blood and plasma extenders held at the dedication of the new Sharp and Dohme Medical Research Laboratories, West Point, Pa.

The protein would be in the form of modified human globin, prepared from human red blood cells by a method first devised by Dr. Max Strumia of Bryn Mawr Hospital, Bryn Mawr, Pa.

It can be fed or injected into veins or under the skin. It has been given to patients with various kinds of cancer, the kidney disease nephrosis, and simple undernutrition. About 60 patients suffering from shock and burns have also been given this human blood medicine with satisfactory results.

Doctors using it reported they thought the patients got the same benefit they would have from plasma.

The relatively new blood material seems to have a future as a plasma extender. It compares favorably with other extenders, such as dextran and PVP, and has some advantages over them.

Science News Letter, May 24, 1952

BIOCHEMISTRY

Tick-Made Blood Chemical Seen Giving Cancer Clue

➤ A CHEMICAL called sanguinin, extracted from human and animal blood and believed to be an antibiotic produced when ticks attack, is giving "a hot new clue to the body's changed chemistry in cancer," in the words of the American Cancer Society.

Sanguinin lowers production by the liver of a vital enzyme, catalase, Dr. J. K. Cline, director of the cancer research department of the Medical College of Alabama in Birmingham, has found.

Catalase production by the liver is also lowered, in people and animals, when there is a rapidly growing cancer anywhere in the body. The function of catalase is to break up hydrogen peroxide into water and oxygen, thus preventing the body from being poisoned by too much of this chemical which it normally produces. Consequently many cancer researchers have thought the principal poisonous effects of cancer were due to its lowering catalase production and allowing increased amounts of hydrogen peroxide to accumulate in the body.

Ticks and mosquitoes are believed to make sanguinin to prevent infection at the place they bite or suck blood, so that the blood will stay fluid for their nourishment.

Dr. Cline tested sanguinin made by Dr. Ludwik Anigstein of the University of Texas. This sanguinin was made by having tryspin digest red blood cells. From its effect in lowering liver catalase production and from other observations, Dr. Cline believes cancers and insects both make sanguinin.

He is trying now to break up the sanguinin molecule, to see which fraction of it blocks catalase. From this may come a method for measuring the amount of active sanguinin fraction in the blood and thus, perhaps, a blood test for cancer.

Compounds to block sanguinin and so allow catalase production to continue might also be discovered. These might prove useful as chemical treatment for cancer.

Science News Letter, May 24, 1952

METEOROLOGY

Winds Against Himalayas Make North Pole Move

➤ MONSOONS PUSHING against the high Himalayas and air masses moving over the Asiatic continent keep the North Pole moving in a flat circle of 20 feet in diameter.

So stated Drs. Walter Munk and Gordon Groves of the Scripps Institution of Oceanography, La Jolla, Calif., at the American Meteorological Society meeting in Washington.

Monsoons, the strongest steady winds in the world, push steadily from north to south against the Himalayan barrier in the winter, and from south to north in the summer, Dr. Munk said.

This, together with the gain in air mass over Asia, has sufficient force to tilt the axis of the earth. However, instead of moving directly south in winter and north in summer, it moves in an ellipse, 16 feet wide one way and 20 feet wide the other way. The South Pole does the same thing.

Astronomers have known for about 60 years, when their observational techniques became good enough, about this movement of the earth's pole, but it was attributed to ocean currents and tides. Dr. Munk declared that ocean currents account for only one percent of the pole's "excursion."

Dr. Munk told SCIENCE SERVICE after he read his scientific paper that the broad general west-to-east winds hitting both the Rockies and the Andes are one of the important factors in the extremely small variations, never more than one-thousandth of a second, in the length of a day.

Science News Letter, May 24, 1952

METEOROLOGY

Hurricanes and Typhoons Spotted by Seismographs

➤ LIVES OF Navy and Air Force pilots now on hurricane and typhoon patrols and thousands of dollars in operational expenses may be saved if a new, inexpensive, shore-based method works out.

All that will have to be done to track the storms over the Atlantic and Pacific is to watch seismographs—the instruments which record earthquakes.

However, according to Dr. Florence W. van Straten, meteorologist with the U. S. Navy, a lot more scientific work must be done. She described a study of eight Pacific typhoons which might be a step forward in proving the method.

Until Dr. van Straten's study, there was disagreement as to whether hurricanes and typhoons directly caused the seismographs to respond or whether the waves from the storms, hitting the beaches, made the wiggles on the instruments. People trying to track hurricanes with seismographs got very poor results. Other people said this was because they actually were tracing the force of the waves on the beaches.

Dr. van Straten told a meeting of the American Meteorological Society in Washington that both things happened. Her eight typhoons were tracked from Guam where there was little chance for beach effects unless the storm came close. When the waves did not increase at Guam, she still got a response from the seismograph. Furthermore, this response pointed to the typhoon with mistakes of only 25 degrees. Where there were high waves in conjunction with a typhoon, her mistakes in direction were as high as 50 degrees.

Now the problem is to try to separate the two responses on the seismograph. This will be relatively easy in the Pacific, quite hard in the Caribbean and Atlantic, she said.

Science News Letter, May 24, 1952

GENERAL SCIENCE

Elect Three Trustees Of Science Service

➤ ELECTION OF three new trustees of SCIENCE SERVICE, the institution for the popularization of science operating as a press association specializing in science, has been announced:

Dr. Duane Roller, professor of physics at Wabash College, Crawfordsville, Ind., nominated by the National Research Council; Charles E. Scripps, chairman of the Edward W. Scripps Trust, Cincinnati; and Dr. Homer W. Smith, head of the physiological laboratories of the New York University College of Medicine, nominated by the National Academy of Sciences. At the annual meeting of the Board of Trustees, last year's officers were reelected.

Science News Letter, May 24, 1952

ENTOMOLOGY

Plants That Kill Insects

New phosphorus compounds are answering farmers' most fantastic dreams of plants that kill their own insect pests. Headway being made in synthesizing insecticides.

By MARTHA G. MORROW

➤ NOW SCIENCE has plants that in effect "bite" the insects that bite them. Some plants can be made to carry in their leaves and stems poison that kills the insects which feed on them.

A number of plants are able to protect themselves naturally against insects. The flowers, leaves or roots of a few are used as insecticides. Still others, not so subtle in their action, like the Venus' flytrap, snap shut on luckless flies and spiders, beetles and ants. But that is old stuff now.

New phosphorus compounds are answering farmers' and florists' most fantastic dreams of plants that kill their own insect pests. Roses and chrysanthemums, taking these insecticides into their sap streams, can now protect themselves against such sucking insects as aphids and mites. These insect are killed by "systemic" poison in the juicy stems and leaves they suck.

Other plants, although perhaps bothered by their own insect pests, have proved themselves effective insecticides. Pyrethrum from dried daisy-like flowers, for instance, paralyzes flies, roaches, beetles and numerous other insects. Large quantities of nicotine, which likewise paralyzes, are extracted each year from low-grade tobacco.

There is news, however, even in these familiar natural insecticides:

Chemical "stretchers," called synergists by the experts, are being developed to increase many times the effectiveness of well-known but expensive insect killers.

Man also is making headway in his attempt to synthesize them.

Sap Stream Poisoned

Systemic insecticides that are taken up in the plant's sap stream seem in part created to meet agriculture's long-standing need for a selective killer. Developed in war-time Germany, some of these organic-phosphorus insecticides kill injurious chewing and sucking bugs, but do not harm others that may be beneficial. A high percentage of aphids are killed, for instance, but few ladybugs that feed on aphids.

Several of the new series of organic phosphorus compounds may become commercially available in the United States this year for the first time. Already available in experimental quantities, Systox and Metacide appear to be satisfactory control chemicals for use against greenbugs on small grains.

The price at which these insecticides will probably be available is not expected to be materially higher than for conventional insecticides. In addition, they offer long-time protection and as little as a quarter of a pound per acre gives excellent results. These chemicals can be applied either to the foliage by spraying, or to the roots by soil applications.

British research with radioactive compounds showed that the leaves absorb more of the organic phosphorus insecticide from their under surfaces than from their upper parts. Also light is essential if the plants are to absorb the insecticide; the plants take up little if kept in the dark.

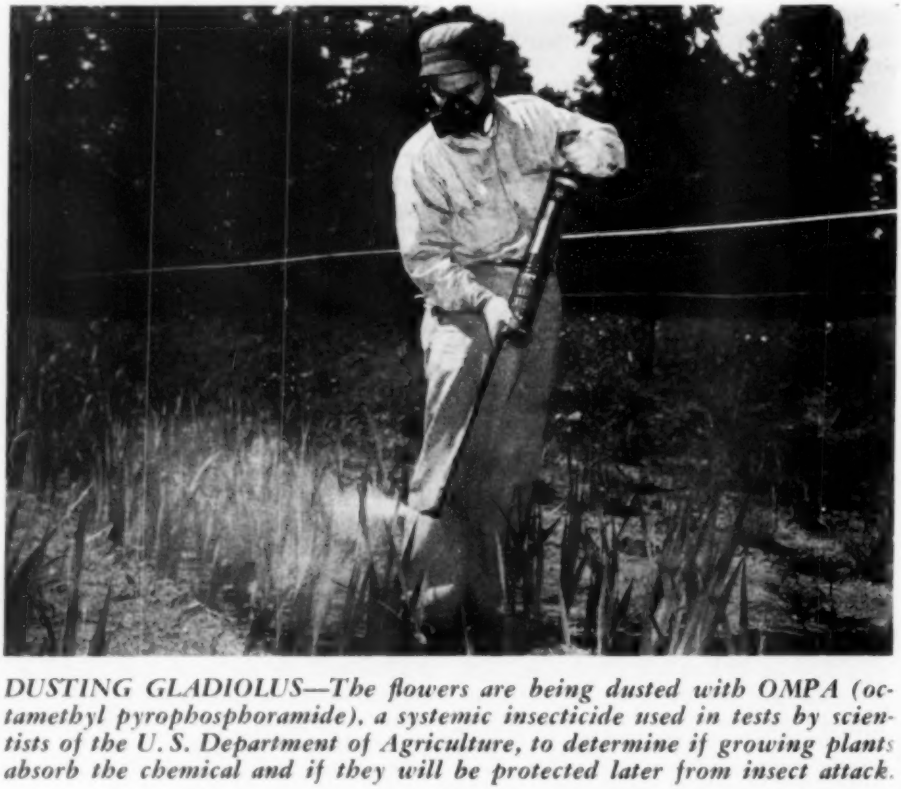
Research with radioactive compounds by the U. S. Department of Agriculture has shown that systemic insecticides enter the sap stream of the plant and move up the stem from the roots or lower leaves to the upper leaves and buds. They do not move down the stem from upper to lower leaves, or from the leaves to the roots.

While highly effective as insect killers, the chemicals are extremely dangerous to handle, and the poison lingers for weeks within the plants, warns Dr. F. C. Bishopp, Asst. Chief of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture. Thus care is being used in releasing the systemic insecticides to the public. Immediate use will probably be limited to non-food crops such as greenhouse flowers, ornamental shrubbery and possibly to cotton.

Pyrethrum's Toxicity Low

In marked contrast to the poisonous systemics are the pyrethrum insecticides. While capable of controlling many insects, they are low in toxicity to humans and animals. Because of this, pyrethrum insecticides are proving particularly useful in controlling some insects attacking food and food products.

Pyrethrum, the basic material used in making these insecticides, is obtained from the daisy-like pyrethrum flower. A member of the chrysanthemum family, it is botanically known as *Chrysanthemum cinerariefolium*. The maximum pyrethrin content is reached in the flower head just about the time the flower opens fully. Most of the pyrethrum available commercially today is produced in Kenya colony in Africa, but some comes from South America and some from Japan.



DUSTING GLADIOLUS—The flowers are being dusted with OMPA (octamethyl pyrophosphoramide), a systemic insecticide used in tests by scientists of the U. S. Department of Agriculture, to determine if growing plants absorb the chemical and if they will be protected later from insect attack.

While known for centuries as a safe and effective insecticide, pyrethrum alone has been in limited use because:

It is too expensive for general use.

It has little lasting power.

To take advantage of pyrethrum's quick paralyzing ability, scientists a decade or so ago began to look for chemicals that would step up its effectiveness. They were searching for synergists that, when combined with pyrethrins, would produce insecticides several times more effective than either chemical used alone.

Hundreds of synergists were tried before the U. S. Department of Agriculture discovered that a number of chemicals containing methylene dioxy-phenyl step up the effectiveness of pyrethrins several times and are as safe as pyrethrins to warm-blooded animals. An outstanding advancement then came through the discovery by scientists of the Mellon Institute that piperonyl hetoxide, piperonyl cyclonene and sulfoxide are the most effective.

Penetrate Insect's Covering

Further work brought the development of another and even better synergist for certain purposes. Called piperonyl butoxide, it is made from safrol, a plant product obtained cheifly from the roots of a South American tree. The new safrol compound penetrates the chitin or body covering of an insect, a desirable quality to combine with pyerthrin's excellent knock-down power.

Two new pyrethrin insecticides, a wheat protectant and a grain protectant, first became commercially available two years ago. Small quantities of them are to be mixed directly with stored grains. These protectants are produced by mixing and milling pulverized wheat or grain dust with a base that contains liquid pyrethrins and piperonyl butoxide.

These protectants will prove themselves particularly useful in southeastern states where many bins and cribs are not tight enough to fumigate effectively. In these areas they can help save the nine percent of stored corn that normally is lost each month during storage.

Synthesize Allethrin

A step forward in man's attempt to synthesize pyrethrin is allethrin, a new man-made product known chemically as the allyl homolog of cinerin I. Similar to one of the four chief constituents of natural pyrethin, it is an effective insecticide.

Allethrin was synthesized in 1949 by Dr. F. B. LaForge and M. S. Schechter of the U. S. Department of Agriculture. It is made by a complicated chemical process that requires 13 distinct chemical operations.

First placed on the market two years ago, allethrin has already shown promise for use on cabbage, cauliflower, lettuce and collards, to control such insects as the cabbage looper, imported cabbage worm and the diamond-back moth. It takes two to three times as much allethrin as pyrethrum, however, to control insects. As other uses of allethrin are discovered, the demand will increase and some day this new chemical may be cheaper than pyrethrin. In the meantime, the search for synthetic pyrethrin continues.

One outstanding advantage of pyrethrum is that houseflies have not built up an immunity to it, the way they have to DDT for instance. This seeming lack of resistance to pyrethrum is being investigated at the University of California College of Agriculture and elsewhere. Radioactive allethrin and pyrethrum are being used to trace its killing action in houseflies.

Nicotine is an effective insecticide. Extremely toxic to warm-blooded animals, its saving grace is its high volatility which causes it to disappear rapidly from products on which it is sprayed or dusted.

Nicotine has been obtained from at least 18 species of *Nicotiana* and a few related plants, but in this country most nicotine is produced from ordinary tobacco. It is extracted from the woody stems and leaf midribs, not suitable for smoking and chewing.

Anabasine, which contains the same number of carbon, hydrogen and nitrogen molecules as nicotine, is unique in that it was first prepared synthetically about two decades ago, then a year later found in the

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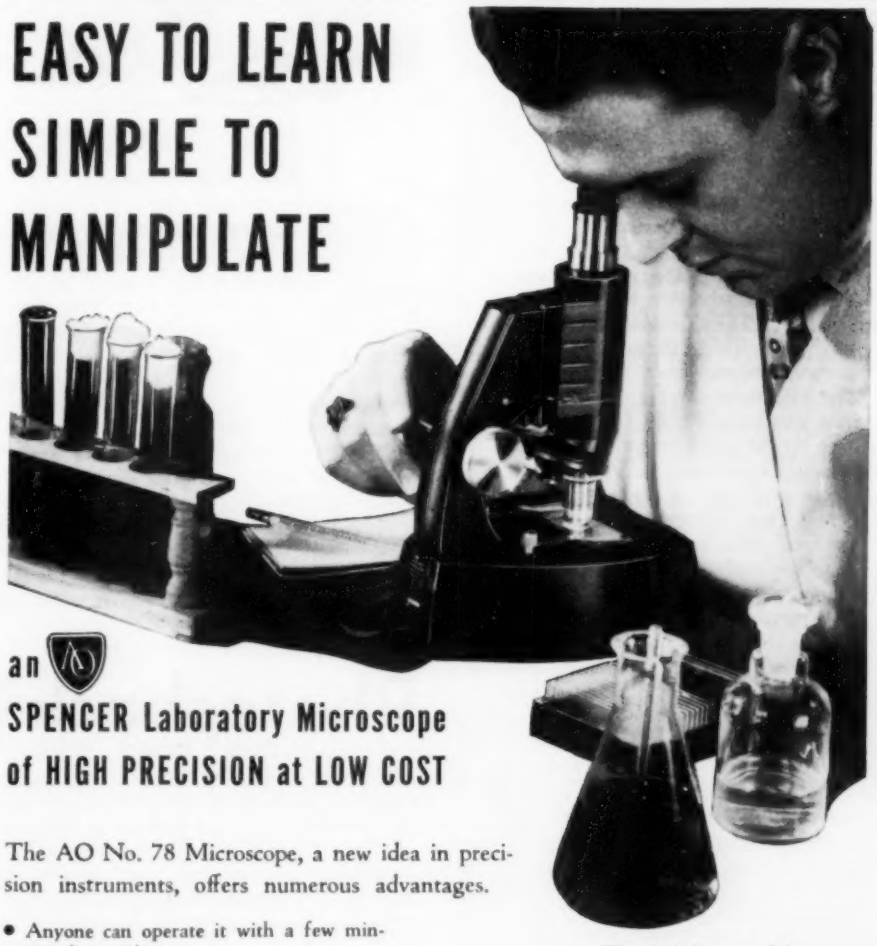

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wild tree tobacco native to our southwestern states and Mexico. Like nicotine, it is an effective insecticide. Although produced in Russia, it has never been developed commercially in the United States.

One of the earliest uses of insecticides was to stun fish so they could be caught easily. Natives in the East Indies, Africa, South America and India crushed various plants in water and poured the mixture into the stream they wished to "fish." Stupefied by the preparation, fish rose to the surface where they were easily caught. Derris, cube and other plants whose roots were so used all belonged to the family *Leguminosae*.

These plants have subsequently been found to contain a compound called "rotenone." Today most of our rotenone is grown in South America.

Discover Rotenone's Structure

Following years of research, the complete chemical structure of rotenone was determined almost simultaneously by groups of chemists in the United States, in Japan and in Germany. The American chemists, who published their results in 1933, were Dr. F. B. LaForge, Dr. H. L. Haller and L. E. Smith, all of the U. S. Department of Agriculture. They devised analytical methods for determining the amount of rotenone in the root dusts.

The effectiveness of rotenone, like pyrethrum, can be increased by mixing it with certain synthetic compounds. The late L. W. Brannon, Department of Agriculture entomologist working in cooperation with the Virginia Truck Experiment Station, in 1947 discovered that piperonyl cyclonene is a particularly effective synergist with rotenone.

The search for other plants with insecticidal qualities continues.

Specimens showing materials that are toxic to insects but low in toxicity to humans and animals have been collected for you by Science Service. Pyrethrum flowers, wheat protectant, grain protectant, allethrin and two other specimens are included in the kit along with suggested experiments. The kit is available for 75 cents. Write Science Service, 1719 N St., N.W., Washington 6, D. C., and ask for the Pyrethrum Insecticide Kit.

Science News Letter, May 24, 1952

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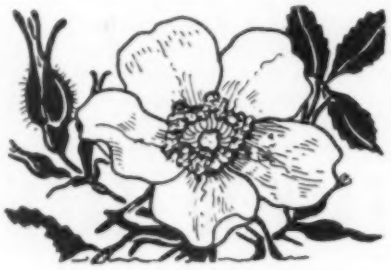
BOTANY

NATURE RAMBLINGS



Fives and Threes

➤ COUNT PETALS on as many kinds of flowers as you can find. Opposite the name of each, put down the number of petals its flowers show, thus: wild rose, five; violet, five; trillium, three; toothwort, four; star-grass, three; and so on.

After you have made your list as long as you can, take a look at the numbers. Notice how they are dominated by five and three. Those two prime numbers are the trademarks of the two great divisions of the flowering plants.

Five is the dominant number among the plants that come up with two seed-leaves, the dicotyledons, or for short, "dicots." Three is the mark of the plants with only one seed-leaf, the monocotyledons, or "monocots."

This "fiveness" is not confined to number of petals alone. The whole flower is apt to have its parts in fives or multiples of five—five sepals, five or ten stamens, five seed-chambers in the fruit.

Similarly, the "threeness" of the monocots will run through all the structures. What appear to be six petals in lily, amaryllis, dog-tooth and tulip are really three true petals surrounded by three sepals that have become petal-like. Botanists, to avoid splitting hairs, call them "perianth-parts."

Sometimes the petals or perianth-parts have become fused together, so that the corolla is bell- or trumpet-shaped as in lily-of-the-valley and trumpet-creeper. Yet even here you are apt to find points or lobes on the margin proclaiming its origin—again three (or sixes) and fives. And the inner structure of the flower, the stamens and the parts of the pistil, will be arranged according to the old basic numbers.

There are, of course, departures from the schemes of fives and threes. The mustard-and-cress family, for example, is so strongly four-petaled and four-sepaled that the group has been named the crucifers, or cross-bearers. Also there are flowers with petals so modified that it is difficult to tell anything about the basic number scheme—Dutchman's breeches, for example, and the wild orchids.

There are also some flowers that produce simply indeterminate numbers of all parts, such as waterlily, magnolia and anemone. But after you have lived with plants for a while you get to regarding these as exceptions or aberrations, and the five-and-three arrangement as the norm.

Science News Letter, May 24, 1952

PSYCHIATRY

Photoshock Treats Psychos

➤ "PHOTOSHOCK" INSTEAD of electroshock is the newest thing in shock treatment for mentally sick persons. In this treatment, an intermittently flashing light is used with a sensitizing drug, Azozol, Dr. George A. Ulett of Washington University, St. Louis, reported at the meeting of the American Psychiatric Association in Atlantic City.

Although it is something like the commonly used electroshock treatment, it is less severe, has a milder onset and seems safer, especially with elderly patients.

The patient does not lose consciousness but has marked changes in his brain wave pattern. This gives an opportunity for research which may help in better understanding of the basic mechanisms underlying all shock treatments.

Electrostimulation, using less current than in conventional electroshock treatment so that convulsions are not produced, was praised by one group of psychiatrists and condemned by another.

Drs. Harry M. Berliner and Fred L. Schartenberg of the VA Hospital at Lyons, N. J., reported that use of this kind of treatment for several years showed it to be safe and effective in certain cases. Included in these are one type of schizophrenia, anxiety states, psychosomatic disorders and reduction of the irritability, anxiety and depression of epileptic patients.

But Drs. Eugene A. Hargrove and A. E. Bennett of the University of California and Dr. Frederick R. Ford of Herrick Memorial Hospital, Berkeley, Calif., reported from their experience that treatment of patients with anxiety or mild depression by electrostimulation is "a very poor second choice to treatment by psychotherapy alone."

Science News Letter, May 24, 1952

At least 3,000 species of *lizards* now are known.

The trumpeter swan is the largest American *bird* of the waterfowl family.

PSYCHOLOGY

Youngsters Show Up Well

Twenty-four-year study of normal children shows that younger generation is not "going to the dogs," even though times were unsettled during formative years.

➤ THE YOUNGER generation is not "going to the dogs."

Intelligence tests of young children should not be taken as seriously as they often are.

Little girls learn to lie earlier than little boys, on the average.

These are some of the findings of a 24-year study of normal children, the longest in the history of research, conducted by Dr. Jean Walker Macfarlane, professor of psychology at the University of California.

Dr. Macfarlane sought to learn more about the problems and satisfactions of children and their parents. She started the study, of 250 families and their children, in 1928. The children were followed from birth to maturity.

The psychologist pointed out that the subjects of the study grew up in an era of many changes and disruptions, including World War II.

"Most of the parents and children lived through it and, in our experience and in contrast to the many claims of the breakdown of morality in our nation, came out with greater understanding, more sense of personal and social responsibility and more personal integrity," Dr. Macfarlane said.

Intelligence tests were given the children at yearly intervals until the age of 18. One out of three children changed 20 or more I.Q. points between six and 18 years; while eight or nine out of 10 changed more than 10 I.Q. points after starting school.

The child's I.Q. score can vary considerably, depending upon his state of health, his worries or lack of worries, his mood, his confidence in himself and his interest in taking a test and upon many other factors. With increasing age, however, tests became more predictive.

As for physical growth, Dr. Macfarlane found the girls reached half of their final height at the age of 20 months, the boys by 26 months. During adolescence the difference in physical maturation was even more marked, and is most marked in junior high school when the girls on the average are two full years ahead of the boys. There are six or seven years difference between the earliest maturing girls and the latest maturing boys.

There was a marked sex difference in the use of devices to cope with childhood problems.

"The girls learned to sidestep the heavy socializing pressures by evasions or outright 'lies' by the tender age of four, when 50% of the mothers reported 'lies' as a problem," Dr. Macfarlane said.

The boys did not hit upon the protective device of lying in sizable numbers until the age of six. But the boys indulged in tempers longer.

Dr. Macfarlane said that the most rewarding part of the study was evidence of how tough and adaptable the human organism is. Many of the subjects, she said, "with many cards stacked against them who should have become delinquent or psychotic not only did not, but rather turned into substantial, mature and zestful adults."

Science News Letter, May 24, 1952

MEDICINE

Shelved Drug Effective Against Fatal Fungus

➤ A DRUG once put on the shelf as useless is staging a comeback in the fight against serious, sometimes fatal fungus diseases in humans.

The drug is called stilbamidine. It belongs to the chemical group of diamidines. The diseases it is stopping are blastomycosis and actinomycosis. The latter is known as "lumpy jaw" when it attacks cattle. Four patients with the first disease and one with the second began to recover promptly after treatment with stilbamidine was started, Drs. Emanuel B. Schoenbach and Joseph M. Miller of New York reported at the meeting of the American Society for Clinical Investigation in Atlantic City.

Tried in two patients with brain inflammation from infection with the yeast-like fungus called Torula, the drug did not help. However, the two doctors recommend further trials of stilbamidine and related chemicals in treatment of the fungus infections.

Science News Letter, May 24, 1952

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AND NOW THE "PLASTIGELS"—Richard W. Quarles, Edward T. Severs, Arthur C. Frechtling and Hugh S. Carpenter—*Mellon Institute*, 5 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. When a thickening agent such as metallic soap is added to vinyl resin plastisols, the latter are converted to putty-like substances suitable for hand modeling and offering possibilities for handicraft.

BACITRACIN—*Research Division, S. B. Penick & Co.*, 127 p., $4.00. A review and digest of the literature on this antibiotic up to and including January, 1952.

BERTRAND RUSSELL'S DICTIONARY OF MIND, MATTER AND MORALS—Lester E. Denonn, Ed.—*Philosophical Library*, 290 p., $5.00. Selections presenting Lord Russell's thinking on a wide variety of subjects, arranged alphabetically. They are not, Lord Russell explains, to be regarded as pontifical pronouncements, but only as "the best that I could do at the time towards the promotion of clear and accurate thinking."

CHILD RORSCHACH RESPONSES: Developmental Trends From Two to Ten Years—Louise Bates Ames, Janet Learned, Ruth W. Metraux, and Richard N. Walker—*Hoeber*, 310 p., $7.50. It is possible to secure Rorschach responses from two-year-olds although they are considered to have more scientific than practical significance. This book from the Gesell Institute will be useful to those testing children.

ELEMENTARY ANALYSIS—Kenneth O. May—*Wiley*, 635 p., $5.00. Especially for those who are going to use mathematics in science, engineering or business or in advanced courses. This is a unified treatment of material usually labeled algebra, analytic geometry, trigonometry and introductory calculus.

ELEMENTARY METALLURGY—W. T. Frier—*McGraw-Hill*, 2nd ed., 258 p., illus., $4.50. A complete revision of a text suitable for technical night schools.

ELEMENTS OF WAVE MECHANICS—N. F. Mott—*Cambridge University Press*, 156 p., $3.75. A text intended for students of experimental physics and as an introduction to more advanced texts for those who intend to specialize. The author is professor of physics at the University of Bristol, England.

EXCAVATIONS AT NEBAJ, GUATEMALA—A. Ledyard Smith and Alfred V. Kidder—*Carnegie Institution*, 90 p., illus., paper, $5.25, cloth $6.00. Important new data were secured as to developments in architecture, ceramics, jade carving, mortuary customs and trade relations.

EXPERIMENTAL NUCLEONICS—Ernst Bleuler and George J. Goldsmith—*Rinehart*, 393 p., illus., $6.50. A textbook for students of nuclear physics and those planning to perform tracer research, covering both chemical and physical aspects of the technique.

FUNCTIONAL ENDOCRINOLOGY FROM BIRTH THROUGH ADOLESCENCE—Nathan B. Talbot, Edna H. Sobel, Janet W. McArthur and John D. Crawford—*Harvard University Press*, 638 p., illus., $10.00. To provide practical information about the functioning of the endocrine systems to practitioners, students and medical research men.

GENERAL BIOLOGY—Perry D. Strausbaugh and Bernal R. Weimer—*Wiley*, 3rd ed., 813 p., illus., $6.00. This edition has been revised, corrected and, in part, re-written to bring it up to date.

GEOGRAPHY IN THE MAKING: The American Geographical Society 1851-1951—John Kirtland Wright—*American Geographical Society*, 437 p., illus., $5.00. Telling what the Society has been and has done and about the progress of geography in the last century.

HOBBY FUN BOOK FOR GRADE SCHOOL BOYS AND GIRLS—Margaret Oldroyd Hyde and Frances W. Keene—*Seahorse*, 128 p., illus., $1.00. Many interesting things that young children can do for fun that will teach them something about science.

AN INTRODUCTION TO THE PRINCIPLES OF PLANT PHYSIOLOGY—Walter Stiles—*Methuen (Pitman)*, 2nd ed., 701 p., illus., $12.50. Recent advances in this subject have necessitated the re-writing of considerable portions of the text.

A LABORATORY EVALUATION OF CERTAIN FEATURES OF COTTON HOUSEWORK DRESS CONSTRUCTION—Mary C. Whitlock, Florence E. Petzel, Bess V. Morrison, and Hazel M. Fletcher—*Govt. Printing Office*, USDA Circular No. 889, 69 p., illus., paper, 25 cents. Results of tests on the strength of seams, patch pockets and buttonholes when constructed in various ways and with different kinds and sizes of thread.

LANDMARKS IN THE HISTORY OF EDUCATION: English Education as Part of the European Tradition—T. L. Jarman—*Philosophical Library*, 323 p., $4.75. Education for all, concludes the writer, is the practice today both in the West and in the communist East. But in the West, the aim is to fit boys and girls for life in a free, democratic community, while in the Soviet-dominated East boys and girls are being trained to unthinking obedience in the servile state.

PARASITISM AND SYMBIOSIS—Maurice Caullery, Translated by Averil M. Lysaght—*Sidgwick and Jackson, (MacMillan)*, 340 p., illus., $5.50. Parasitism from the point of view of general biology.

POLITICAL ETHICS AND THE VOTER—Thomas A. Rousse, Ed.—*H. W. Wilson*, 181 p., $1.75. A group of articles reprinted from various sources and offering food for thought in an election year.

THE PRINCIPLES OF THE CONTROL AND STABILITY OF AIRCRAFT—W. J. Duncan—*Cambridge University Press*, 384 p., illus., $8.00. Presenting material a great deal of which cannot yet be found in textbooks. Included is a dictionary of British-American equivalents in aerodynamic terms and symbols.

SCIENCE AND SOCIETY—Robert F. Ervin, Ed.—*University of Notre Dame Press*, 54 p., illus., paper, $1.00. Papers presented at a symposium at Lobund Institute to consider the interrelationships of science and man.

STEAM POWER PLANTS—Alexander H. Zerban and Edwin P. Nye—*International Textbook Co.*, 524 p., illus., $7.50. A text for junior or senior students in mechanical and electrical engineering who have had some previous work in heat power. Nearly 70% of all electric power is generated in steam stations.

TELEVISION THE MAGIC WINDOW—Frank Denman—*Macmillan*, 60 p., illus., $2.00. Explaining in simple terms the workings of your television and the science that makes it possible.

Science News Letter, May 24, 1952

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MEDICINE

Patients' TB Germs Develop Drug Resistance

➤ TUBERCULOSIS germs in human patients already are developing resistance to the new anti-tuberculosis drugs, isonicotinic acid hydrazides.

In three patients "definite evidence" of drug resistance appeared after seven weeks of treatment and in one the first sign of such resistance appeared after 26 days, Dr. William Steenken, Jr., Gordon M. Meade, Emanuel Wolinsky and E. Osborne Coates, Jr., of the Trudeau, N. Y., Foundation and Sanatorium report in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (May 10).

The patients had tuberculosis of the lungs with cavity formation. All three and three others with the same type of the disease had previously been given streptomycin and PAS without improvement. They were started on the new drugs on Jan. 18.

In only one of the six has the sputum been converted to negative as shown by culture tests. Four of the six have as many or more TB germs, as shown by sputum counts, than they did before starting treatment with the new drugs.

These drugs, the doctors warn, can thus be expected to produce only temporary benefits if used alone in patients with this type of tuberculosis.

Science News Letter, May 24, 1952

ARCHAEOLOGY

25,000 Yr. Old Corn Pollen

➤ THE OLDEST maize pollen grains ever found have been dug up about 240 feet below the surface of the dried lake bed on which Mexico City was built. They are at least 25,000 years old, possibly much older, dating back into glacial times, judged by the depth at which they were found.

"This discovery opens up the whole question of the origin of maize, or Indian corn, whose modern form is not known to live long without the aid of man," Dr. Paul B. Sears of Yale University told SCIENCE SERVICE. He revealed the find to scientists attending the Symposium on Climate Change in Boston.

"The discovery also adds interest to the problem of ancient man in Mexico," Dr. Sears stated. "Were the plants from which the pollen came wild or were there people in Mexico who were growing it? It is difficult to think that man may actually have been farming since we have previously considered him a hunter at that early stage."

The maize pollen grains were buried in layers 230 to 250 feet deep. They were discovered and identified by Mrs. Kathryn H. Clisby, research associate in geology at Oberlin College, Ohio. Their identity has been confirmed by Drs. Elso Barghoorn and Miss Margaret Wolfe of Harvard University who have been collaborating with Dr. Paul Mangelsdorf in the study.

"We shall have to hunt the ancestors of Mexico man, as well as those of corn, much earlier than we had thought necessary," Dr. Sears said. "There is, however, increasing evidence, such as the recent findings of flint points in the same layers with elephant bones, that man lived in Mexico during the last of the Pleistocene Age."

The hunting weapons and bones have been judged by dating with the radioactive carbon calendar to be about 11,000 years years old.

Yale University, Oberlin College, Harvard University, the Geological Society of America and the Viking Fund jointly backed the research that led to the discovery of the 25,000 year-old maize pollen grains. Mexican scientists are collaborating in the search for remnants of ancient man in Mexico. The jeep used in the field work was donated by Willys-Overland.

Science News Letter, May 24, 1952

OLDEST MAIZE POLLEN—One of the maize pollen grains found buried 231 feet deep under Mexico City. Others of the same type were found in somewhat deeper layers. Width of the grain shown in the cut is just under 100 microns, about the size of thick human hair.

OCEANOGRAPHY

Gulf Stream Meanders With Seasons And Tides

➤ THE GULF Stream meanders probably as far south as the Florida Straits, three U. S. Navy oceanographers reported to the American Geophysical Union meeting in Washington.

Joseph E. O'Hare, Quick H. Carlson and William E. Tamblyn of the Navy's hydrographic office said that observations made with Loran to get the ship's exact position combined with meteorological data showed that the wanderings of the Gulf Stream are apparently related to seasonal and tidal cycles. The meanderings have previously been known to exist north of Cape Hatteras, off the North Carolina coast.

Science News Letter, May 24, 1952

● RADIO

Saturday, May 31, 1952, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Norris E. Dodd, director-general of the United Nation's Food and Agricultural Organization, discusses "Food of the World."

FORESTRY

Bulletwood May Be Easier On Office Girls' Nylons

➤ "OH, DARN! I've got a run in my stocking," may well become an outmoded refrain for career girls if the tropical wood, *Manilkara bidentata,* is used to make the legs of office furniture.

This wood, commonly known as bulletwood, is extremely durable and practically impervious to abrasions, thus furniture made of it would have none of the nasty scars and splinters that put runs in stockings.

Bulletwood is two and a half times as strong as white oak, the most widely-used North American hardwood, Prof. Frederick F. Wangaard of Yale University's Forestry School, New Haven, Conn., reports. Its wood is a dark red, but it is plain, not highly figured like mahogany, and can be machined to an extremely smooth finish.

Science News Letter, May 24, 1952

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FISH LURE made of a tough, corrosion-resistant plastic has a realistic wiggling, wobbling motion to attract game fish. Especially suitable for fishing in weed beds and among lily pads, the lure has a wire spring on its underside which causes it to turn over for easy retrieving when it comes in contact with weeds.

Science News Letter, May 24, 1952

STEREO SLIDE mount for 35 mm. stereoscopic film transparencies is designed for use with a new plastic stereo viewer as well as present-day stereo viewers. Made of a clear plastic, the mounts have slots into which transparencies and slide titles can be inserted quickly by the amateur.

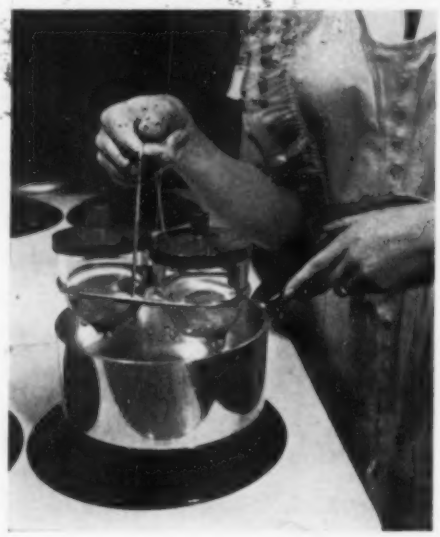
Science News Letter, May 24, 1952

WORK GLOVES, which reportedly outlast conventional work gloves four-to-one, have their thumbs in line with the fingers instead of set to one side, and can be worn on either hand. A fleecy inner-lining and a protective, durable, acid-resistant plastic coating provides the wearer comfort as well as a strong grip.

Science News Letter, May 24, 1952

TIMING UNIT for air conditioning equipment turns the machinery on and off automatically at any desired time, day or night. Driven by an electric clockwork, the device can be set to keep the machinery off any day or days when it is not needed.

Science News Letter, May 24, 1952



EGG COOKER outfit consists of two glass cups into which eggs are broken, as shown in the illustration. Covered by red plastic tops, the cups fit into a metal holder having a wire handle. The assembly is lowered into hot water and the eggs cooked to the desired consistency.

Science News Letter, May 24, 1952

PARALLEL COMPASS has a mechanical arrangement that keeps the lower half of its legs perpendicular to the paper regardless of the degree the compass is opened. A lock-screw in its geared head prevents a change in the instrument's setting, thus allowing circles of the same diameter to be drawn without rechecking the compass.

Science News Letter, May 24, 1952

REFLECTIVE SHEETING for outdoor signs has an adhesive backing that sticks to smooth, non-rusting surfaces. Signs using the material can be placed at sharp angles to highways yet still reflect the message in bright, full colors.

Science News Letter, May 24, 1952

RUBBER-TESTING DEVICE determines contamination and deterioration of rubber specimens by using infra-red light to generate temperatures up to 280 degrees Fahrenheit. Low-quality specimens break down under the heat in just a few minutes.

Science News Letter, May 24, 1952

Do You Know?

The age of a *fish* can be determined by the rings on its scales.

The average white *blood cell* lives 13.2 days.

There are no *snakes* in Madagascar, Ireland and New Zealand.

The Indian buffalo has grown a single *horn* measuring about six feet, five and one-half inches, the longest known horn.

More than 43% of all businesses experiencing a serious *fire* never resume business, because they cannot replace their records.

Air is sucked into a modern jet engine at the rate of three tons per minute, and airspeed inside the engine reaches 1,200 miles per hour.

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